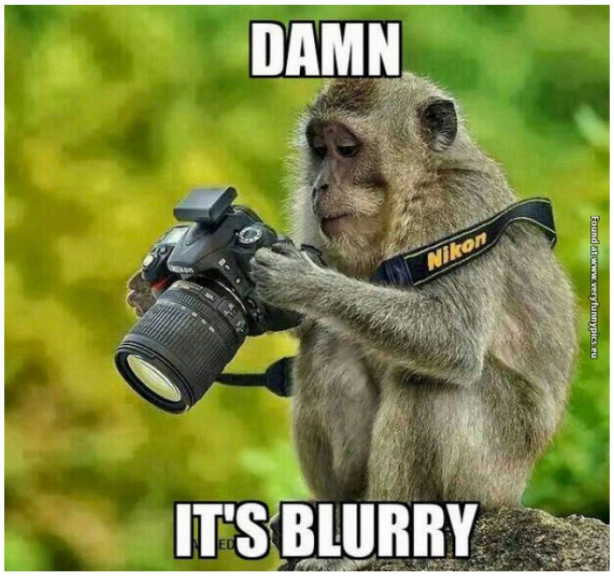
“The Top 5-Errors In On-Scene Traffic Crash Photographs and How To Avoid Them.”

1. **Not Knowing How To Use Your Camera or Understanding Its Capabilities**

Understand how to work your camera and what it is capable of (or not capable of). The time to learn what your camera can do is before you need it, not at an accident scene.

2. **Photographs Out Of Focus**

A central focus point always produces the sharpest focus.



Auto focus is not ideal when taking photographs at a nighttime or low light traffic crash scene.

3. **Photographs Too Light Or Too Dark**

ISO is how sensitive the camera sensor is to light. A photo taken with a high ISO can be taken in very low light conditions but will often cause “noise” which makes the photo look grainy.

ISO is used to control the brightness or darkness of our photos. In most lighting situations, you can use the following guide when adjusting your ISO settings:

- ISO 100–200: Use during sunny, outdoor conditions or in places with a lot of available light.
- ISO 400-800: Use on cloudy overcast days or indoors with less available light.
- ISO 1600-3200: Use in cases with little to no available light.

Use the slowest practical shutter speed so that you can keep your ISO setting as low as possible.

4. **Not Using A Tripod (Or Monopod)**

   A tripod provides stability to the camera and helps to avoid camera shake, especially in situations where longer exposure times are necessary.

   A tripod is an essential tool in low light situations such as a crash scene in the middle of the night. There comes a time where you can no longer hold the camera steady in your hand so using a tripod will greatly assist you.

   A monopod is smaller in size and weight than a tripod.

5. **Over (Or Under) Exposure**

   Use the Exposure Triangle to determine the settings on your camera to give you the best photograph possible.

A word, or two, on Auto-Focus or the Automatic Setting on your phone.

Automatic Exposure is when the camera chooses the best shutter speed, aperture, ISO and flash settings for your shot. All you need to do is point and shoot. The photograph is correctly exposed as the day is well lit, though auto-exposure may struggle in situations where the light is uneven, and it tends to trigger the flash even when it's not necessary.

Autofocus tends to have problems working properly when the subject and background are a similar color or when the subject is partly in bright sun and partly in shadows. While automatic focus is not as precise as manual focus, autofocus will allow the camera to focus on the subject in the center of the frame. Most cameras in full auto mode (like your cell phone's camera) will simply put everything in focus.

Symbol	*Exposure Mode*	*Description*
P	Programmed Autoexposure	Camera selects both the f-stop and shutter speed to ensure proper exposure, but the user can choose from multiple combinations of the two settings.
A	Aperture-priority Autoexposure	The user selects f-stop, and the camera selects the shutter speed that will produce a good exposure.
S	Shutter-priority Autoexposure	The user sets shutter speed, and the camera selects the f-stop that will produce a good exposure.
M	Manual Exposure	The user controls both the shutter speed and f-stop.

APERTURE (f-stop)

The aperture (f-stop) controls the amount of light reaching the sensor through the lens. The aperture size will regulate the sensor's degree of exposure to light.

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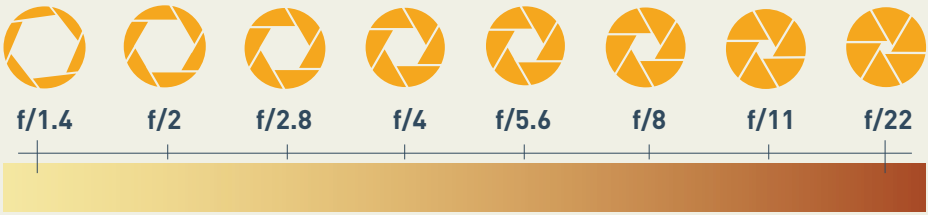
14cm x 21cm / 5.83" x 8.27"

APERTURE SCALE

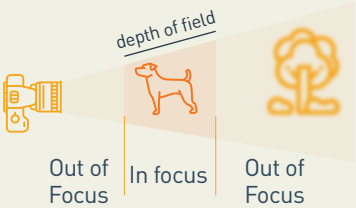


BRIGHTER
Allows MORE light in

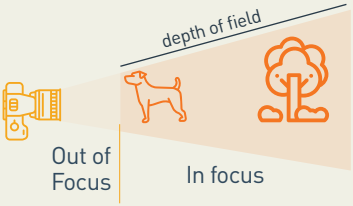
DARKER
Allows LESS light in

DEPTH OF FIELD FACTOR

BRIGHTER
SHALLOW DEPTH OF FIELD
BLURRED BACKGROUND



DARKER
DEEP DEPTH OF FIELD
EVERYTHING IN FOCUS



CREATIVE USES

f/1.4
Bokeh effect
Low light

f/2.8 - f/5.6
Portraits - Sports

f/8 - f/16
Landscapes

f/16 - f/32
Long exposure

TAKING SHARP PICTURES

A sharp photograph results from several factors- all of which are of equal importance. These factors are: properly holding the camera, enough DOF, the lowest ISO setting possible, and a fast enough shutter speed to prevent camera shake.

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BEFORE SHOOTING

• PICK A MID-LEVEL APERTURE

f/5.6 to f/8 is a safe spot to give you enough depth-of-field (DOF) with most lenses.

• HOLD THE CAMERA STEADY

Make sure that your arms are always in a comfortable position, with your elbows resting on your sides, legs or a steady surface. If not possible, use a tripod.

• MIND THE ISO

Use a low to mid (200 to 640) ISO range to allow a good exposure, along with a proper shutter speed, and a mid-level aperture. A noisy image at higher ISO settings, **may seem** to appear unsharp.

• SHUTTER SPEED AND FOCAL LENGTH

When handholding the camera, the shutter speed shouldn't be slower than the focal length of the lens in use. This rule does not apply if using a tripod.

Telephoto - 70mm
Shutter Speed: 1/80 and faster

Wide angle - 28mm
Shutter Speed: 1/30 and faster

REFERENCE GUIDE*

● Not recommended ● Depends on the situation ● Recommended

HANDHELD - WITHOUT THE BENEFIT OF IMAGE STABILIZATION

Shutter Speed	1/10	1/20	1/60	1/125	1/400	1/1000	1/2500
Focal Length 15mm	●	●	●	●	●	●	●
28mm	●	●	●	●	●	●	●
50mm	●	●	●	●	●	●	●
200mm	●	●	●	●	●	●	●

HANDHELD - WITH IMAGE STABILIZATION

Shutter Speed	1/10	1/20	1/60	1/125	1/400	1/1000	1/2500
Focal Length 15mm	●	●	●	●	●	●	●
28mm	●	●	●	●	●	●	●
50mm	●	●	●	●	●	●	●
200mm	●	●	●	●	●	●	●

* This information should be taken as a general reference guide, since the results may vary depending on camera and lens models.

EXPOSURE TRIANGLE

Proper exposure is achieved by 3 camera functions coming into balance: ISO, f/stop and shutter speed. This is called the "Exposure Triangle".

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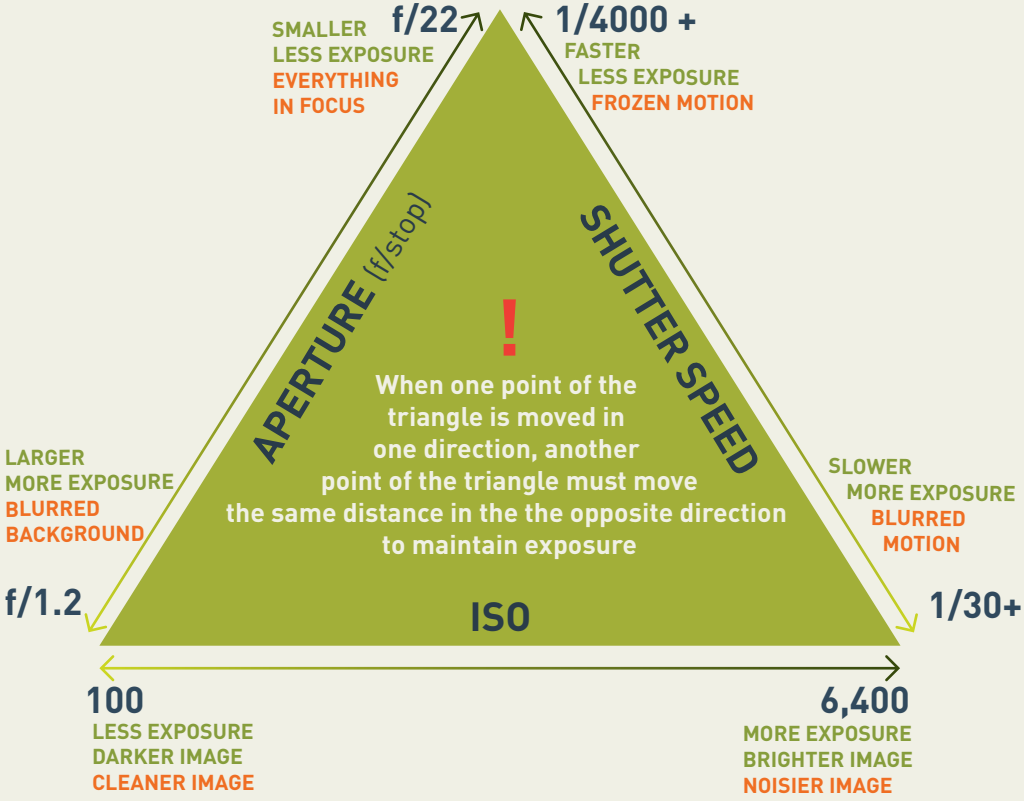

PRACTICAL EXAMPLE

FULL SUN - OUTSIDE

Initial camera setting:
ISO: 100
Shutter Speed: 1/125
f/stop: f/16

Situation:
Subject is fast moving, you need to increase the shutter speed to get a sharp image.

Improved camera setting, as per the exposure triangle:
ISO: 100 | No change
Shutter Speed: 1/500 Move two stops up
f/stop: f/8 Move two stops down

MANUAL MODE

Manual mode requires the photographer to physically set 3 camera functions: ISO, f/stop and shutter speed.

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1 SET THE ISO

100	200	400	800	1600	3200
Sunny	Partly cloudy	Overcast	Indoor / Sports	Poor light	Dark / Night

Less noise / grain ← → More noise / grain

2 SET THE APERTURE

f/1.4	f/2	f/2.8	f/4	f/5.6	f/8	f/11	f/22

BRIGHTER
SHALLOW DEPTH OF FIELD
BLURRED BACKGROUND

DARKER
DEEP DEPTH OF FIELD
EVERYTHING IN FOCUS

3 CHECK CAMERA METER FOR PROPER EXPOSURE:

-2 | | -1 | | 0 | | +1 | | +2

Under — Over

4 ADJUST SHUTTER SPEED OR APERTURE UNTIL PROPER EXPOSURE

Fast shutter speed: freeze action ← → Slow shutter speed: blur motion

Underexposed reading

-2 | | -1 | | 0 | | +1 | | +2

Adjust the shutter speed or the aperture until the meter reads 0.

Proper reading

-2 | | -1 | | 0 | | +1 | | +2

Overrexposed reading

-2 | | -1 | | 0 | | +1 | | +2

Adjust the shutter speed or the aperture until the meter reads 0.

5 FINAL CHECK

- Adjust exposure based on the subject:
  Do you need to freeze action or increase the depth of field?

- Keep the camera meter indicating proper exposure:
  Is the image too light? Move the camera meter towards underexposure (under 0)
  Is the image too dark? Move the camera meter towards overexposure (over 0)

SHUTTER SPEED

Shutter speed is the length of time that the camera shutter is open to expose light into the camera sensor.

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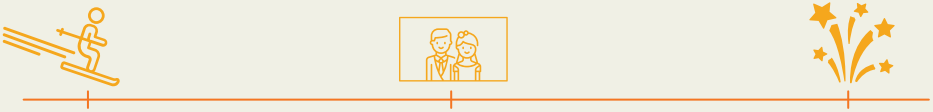
HOW TO SET THE RIGHT SHUTTER SPEED TO GET SHARP IMAGES



1/4000-1/1000
Freezing fast moving objects

1/250 - 1/60
Everyday photos. Objects still or barely moving

1/30 -10"
Capturing motion with blur

SITUATIONS

1/4000
Very fast moving objects

1/1000
Fast movement, sports

1/500
People running or slow moving sports

1/250 - 1/60
Slow moving people, children

1/60
Slowest handheld setting for sharp images

1/30 - 1/2
Motion blur on consistently moving objects: waterfalls, rivers, cities

2"
Long exposure; fireworks

5"- 10"
Long exposure: painting with light, stars, milky effect on moving water

LONG EXPOSURE / CREATIVE EFFECTS

BLUR FACTOR

1/2000 **1/250** **1/20** **1/2**

CAMERA EXPOSURE BASICS

Mastering Manual Mode

When you take a photo, you are letting light into the camera and that light creates an image on a digital senor or a piece of film.

The amount of light being let into the camera is controlled aperture, shutter speed and ISO. The relationship between these 3 elements is called the exposure triangle and once you understand the exposure triangle, you will understand how to use manual mode.

ISO

ISO is how sensitive the camera sensor is to light.

A photo taken with a high ISO can be taken in very low light conditions but will often cause noise which makes the photo look grainy.

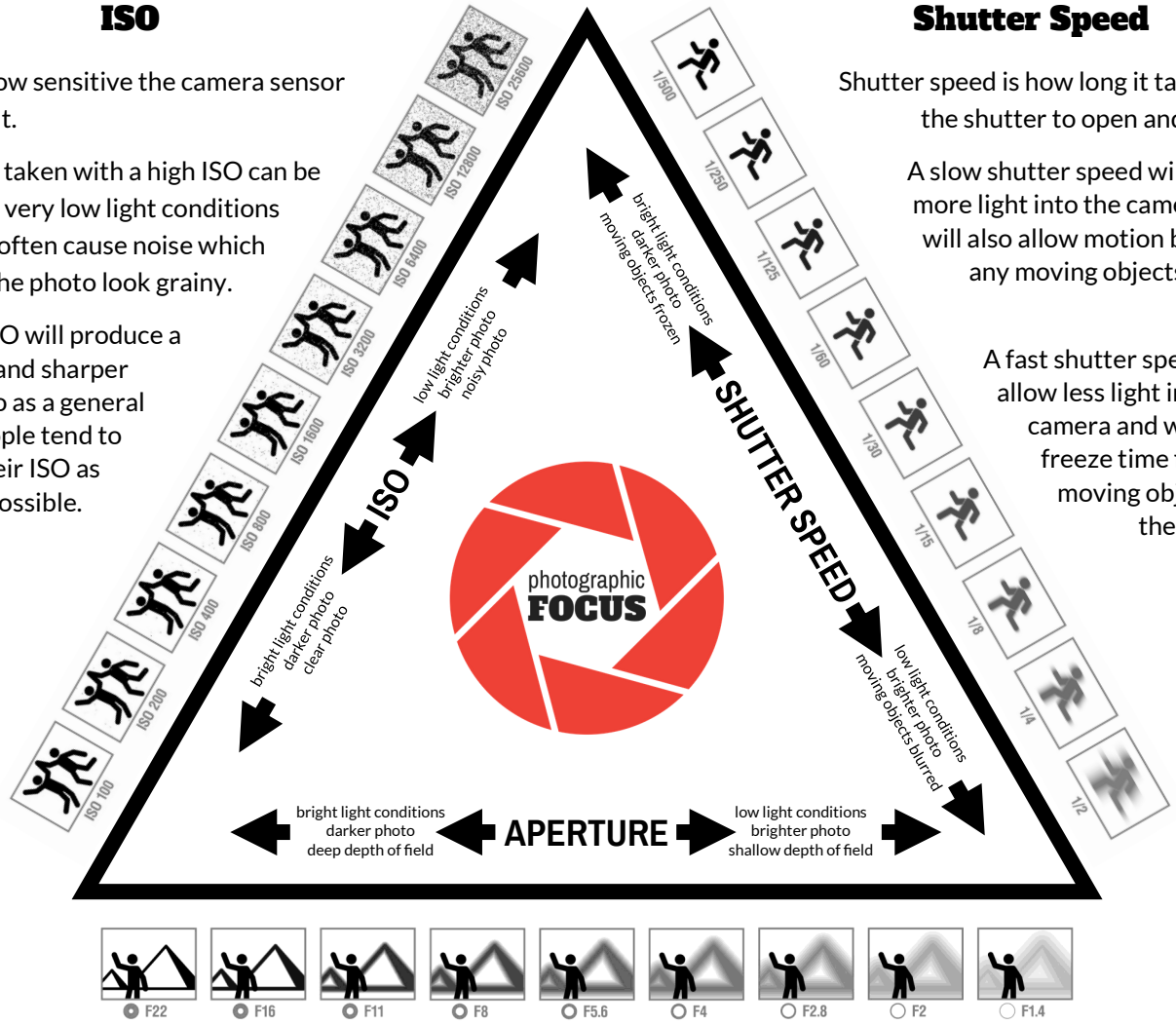
A low ISO will produce a clearer and sharper image so as a general rule people tend to keep their ISO as low as possible.

Shutter Speed

Shutter speed is how long it takes for the shutter to open and close.

A slow shutter speed will allow more light into the camera but will also allow motion blur for any moving objects in the frame.

A fast shutter speed will allow less light into the camera and will also freeze time for any moving objects in the frame.



Aperture

Aperture is the size of the lens opening. It's similar to the pupil in the eye.

A low f-stop number, like f1.4, means a larger lens opening and more light entering the camera. This will also have a shallow depth of field which means your subject will be in focus but the background won't be. Low f-stop numbers are great for portraits.

A high f-stop number, like f16, means a smaller lens opening and less light entering the camera. This gives a deep depth of field which means everything in the frame will be in focus. High f-stop numbers are great for landscapes.

Exposure Meter

When you're shooting in manual mode, your goal is to have the EV (exposure value) at zero so you have a correctly exposed photo.

Below are some examples of what the exposure meter in your camera will look like.